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VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION,
LONGFIELD SMITH, Agronomist in Charge,
St. Croix, Virgin Islands, U. S. A.

Under the supervision of the STATES RELATIONS SERVICE,
Office of Experiment Stations, U. S. Department of Agriculture.

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REPORT OF THE VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION.

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Issued November 5, 1920.

WASHINGTON:
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[Under the supervision of A. C. True, Director of the States Relations Service, United States Department of Agriculture.]

E. W. Allen, *Chief, Office of Experiment Stations.*

Walter H. Evans, *Chief, Division of Insular Stations. Office of Experiment Stations.*

STATION STAFF.

Longfield Smith, *Agronomist in Charge.*
Charles E. Wilson,[1] *Entomologist.*

LETTER OF TRANSMITTAL.

Agricultural Experiment Station,
St. Croix, Virgin Islands, October 4, 1919.

Sir: I have the honor to transmit herewith and to recommend for publication a report of the Virgin Islands Agricultural Experiment Station, 1919.

Respectfully,

Longfield Smith,
Agronomist in Charge.

Dr. A. C. True,
Director States Relations Service,
U. S. Department of Agriculture, Washington, D. C.

Publication recommended:
A. C. True, *Director.*

Publication authorized:
E. T. Meredith, *Secretary of Agriculture.*

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[1] Appointed Apr. 21, 1919.

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REPORT OF THE VIRGIN ISLANDS AGRICULTURAL EXPERIMENT STATION, 1919.

By Longfield Smith, *Agronomist in Charge.*

INTRODUCTION.

The Agricultural Experiment Station of St. Croix passed into the hands of the Federal authorities on January 1, 1919, at which time it became the Virgin Islands Agricultural Experiment Station (Pl. I, fig. 1), the activities of the station being extended so as to cover the three islands, St. Croix, St. Thomas, and St. John.

ST. CROIX.

With regard to size and agriculture St. Croix is the principal island of the group. It has an area of approximately 84 square miles, of which about one-quarter is cultivated. The rest, for the most part, is planted to guinea grass and is used for pasturage. Probably only 5,000 acres is useless land.

The principal industries of the island are the raising of cattle, sugar, and cotton, and the manufacture of rum.

The area devoted to the cultivation of sugar is approximately 13,000 acres, and it remains fairly constant from year to year, but the quantity of sugar exported varies greatly, depending upon the weather conditions encountered by the growing crop. In 1909, for example, only 4,000 tons was exported, while in 1916 the island of St. Croix contributed over 16,000 tons to the world's sugar supply. The exports for 1918 were about 6,000 tons, those for 1919 will probably reach 11,000 tons, and present indications are that in 1920 a bumper crop will be produced (Pl. I, fig. 2).

The area devoted to cotton growing is small at present, only some 200 acres having been planted to that crop in 1918. It is probable that a larger acreage will be planted to cotton this year. Before the war a much larger area was planted to this crop; for instance, in 1912 about 268,000 pounds of Sea Island cotton was exported. The prevailing high prices for sugar and the uncertainty of the future of Sea Island cotton caused the majority of cotton planters to abandon its cultivation. The few, however, who stuck to the business, were rewarded by handsome returns. Both the climate and the soil of St. Croix are well suited to the cultivation of Sea Island cotton. On favorable soil returns of from 200 to 250 pounds of lint can be confidently expected.

As a result of the scarcity of labor, the live-stock industry of the island is becoming more and more popular. Until quite recently there was practically no inducement to increase the number of stock

raised on the island, since the opportunity to export animals was very small. The war, however, developed an export market in Porto Rico, where it seems quite likely to continue. The local price of cattle is now 7 cents per pound live weight.

The total number of cattle on St. Croix in 1918 was estimated by the local food commission to be as follows:

	Number.
Bulls	1,656
Steers	939
Cows	3,011
Heifers	1,247
Calves	2,116
Total	8,969

In addition to cattle, horses, mules, sheep, and hogs are raised, some of these animals being available for export at the present time. A hog-raising industry probably could be made quite a profitable one here, more especially since the recent establishment of a cooperative dairy in Christiansted increases the available food for hogs.

In the past, the manufacture of rum played a considerable part in the industries of the island. Nearly 100,000 gallons was exported in 1903, and the average for the past 20 years exceeded 60,000 gallons. The greater part of this rum was made from raw cane juice. On account of the prohibition law it seems quite likely that the manufacture of sirup will take the place of rum at the factories which, at comparatively little expense, can readily be adapted to this purpose. It is not likely, however, that the manufacture of sirup will yield the high profits gained from the manufacture of rum.

ST. THOMAS.

The island of St. Thomas, which has an area of approximately 28 square miles, is too hilly for any kind of agriculture requiring the use of regular implemental tillage; it is, however, well adapted to the raising of stock, the only drawback being lack of feed for the animals during the dry months of the year. This difficulty could be readily overcome by the use of silage. Efforts are now being made by the experiment station to encourage the erection of silos in the island. Guinea grass, which grows freely on the hills, should make excellent material for silage, though it would be rather expensive to cut. Napier grass and sorghum (imphee) could be successfully grown for the same purpose, as also could some of the native legumes, especially the common blue wis (*Clitoria ternatea*), which the cattle eat eagerly.

It is probable that pineapples could be successfully raised in St. Thomas, but inasmuch as all the cultivation would have to be done by the use of hand implements, the cost involved would be heavy. It is very difficult to suggest likely profitable crops for St. Thomas, since much of the labor is done with only hand implements.

Sisal requires much less cultivation than most other crops and would probably be well suited to the soil and climate of the island.

Everything taken into consideration, it would seem that the cattle-raising business is the most promising line of agriculture for the island at this time.

ST. JOHN.

St. John has an area of approximately 20 square miles. There is every reason to believe that at some time in the past this island was in a flourishing agricultural condition, the many ruins of "great houses" and sugar-cane mills bearing evidence to this fact. To-day, however, there are no roads and the island is practically abandoned, the inhabitants numbering only 960, nearly all of whom are negroes. The hilly nature of the island is chiefly responsible for this abandonment, the necessary hand tillage being too expensive to permit planters to raise sugar cane so as to compete with that produced in other places.

As is the case with the island of St. Thomas, it is thought that sisal would prove a likely crop for St. John.

Since guinea grass, which serves as an excellent forage crop, grows readily on the hills of the island, cattle are easily raised. These are for the most part sold in St. Thomas. All the produce of the island is sent to St. Thomas in sloops, no steamers ever calling at St. John.

Bay trees, which flourish on the hills, form the basis for the manufacture of the well-known St. Thomas bay rum. The bay oil is made in St. John and the process of mixing it with alcohol to form bay rum is carried out in St. Thomas. Approximately 500 gallons of bay oil is produced annually in St. John. This industry could be considerably enlarged.

Some of the natives of the island are very clever in the art of weaving baskets and mats from the stems of a wild vine which grows abundantly; it is believed that this industry, if fostered, could probably be extended and made profitable.

Since the transfer of the experiment station to the Federal authorities the agronomist in charge has not had time to visit the island of St. John; it is hoped, however, that he can do so very shortly.

WORK AT THE STATION.

The work of the experiment station has been continued on lines similar to those developed during the past seven years.

Experiments with varieties of sugar cane, as usual, occupy a very prominent place at the station, and next in importance is the work with cotton, corn, and leguminous crops. Much experimental work is also done with coconuts, citrus plants, papayas, grasses, and sweet potatoes.

EXPERIMENTS WITH SUGAR CANE.

Approximately 34 acres of land at the station was under experiments with sugar cane during the past fiscal year. These experiments were conducted for the following purposes: (1) To raise new varieties of sugar cane; (2) to propagate varieties of cane imported

from other countries; (3) to ascertain those varieties of cane most worthy of extended cultivation; (4) to produce the most promising sorts of cane in sufficient quantity to permit of liberal distribution of cuttings for large trials on estates situated in different parts of the island; (5) to determine the best method of applying farmyard manure to cane; and (6) to find the most efficient ways to prepare the ground for planting and to plant cane.

VARIETY TESTS.

One hundred and twenty varieties of cane were under experiment during the year. Of these 30 were imported varieties, the remainder being St. Croix seedlings, which had given promise in previous trials.

Cane S. C. 12/4 (Pl. II, fig. 1).—So far this variety has shown the most promise in every test and for this reason has been grown on the largest scale. Besides the experiments conducted at the station, this cane was grown in large plats on several plantations of the island. Moreover, it was tested at Sion Hill in two fields, one consisting of 10 acres and the other of 5 acres. The total area devoted to this cane was about 26 acres. During the planting season of 1918–19 approximately 170,000 cuttings were distributed. The area to be cut next year should be about 100 acres.

The results obtained this year with S. C. 12/4 confirmed those of former trials. Wherever on the estates it was possible to do so, fair weight comparisons were made with the standard cane, Ribbon, the latter being grown in the same field. In all cases the S. C. 12/4 gave large increased weight. The canes yielded to the station's small mill quite as much juice as the standard cane, and the juice was generally distinctly richer in sucrose. At Mount Pleasant plantation, 25 per cent increase in weight was recorded; at Hogensborg, 40 per cent; and at Sion Hill, 80 per cent. The sucrose content of the juice of the cane grown at Sion Hill was 10 per cent greater than that of the standard cane in the same field. When S. C. 12/4 cane is ripe, it produces juice containing 20 per cent sucrose. Juice of ripe ratoons has been known to yield 24 per cent sucrose.

Planters now recognize the merits of S. C. 12/4, which is likely soon to be spread all over the island. Some years ago a barrel of cuttings of this cane was sent to the Mercedita plantation in Porto Rico. In June, 1919, the writer saw remarkably good-looking cane of this variety growing on about 3 acres of that estate. The cane is to be cut during the planting season of 1919 so that cuttings for a larger trial can be made. Definite field results from Porto Rico will not be available until 1921.

In the spring of 1919, 3,000 cuttings of S. C. 12/4 were sent to the experiment station at Mayaguez, P. R. Cuttings were also sent to Nevis, Guadeloupe, and Argentina.

The canes of the S. C. 12/4 variety are fairly stout, average specimens having a circumference of from 5 to 6 inches. The internodes

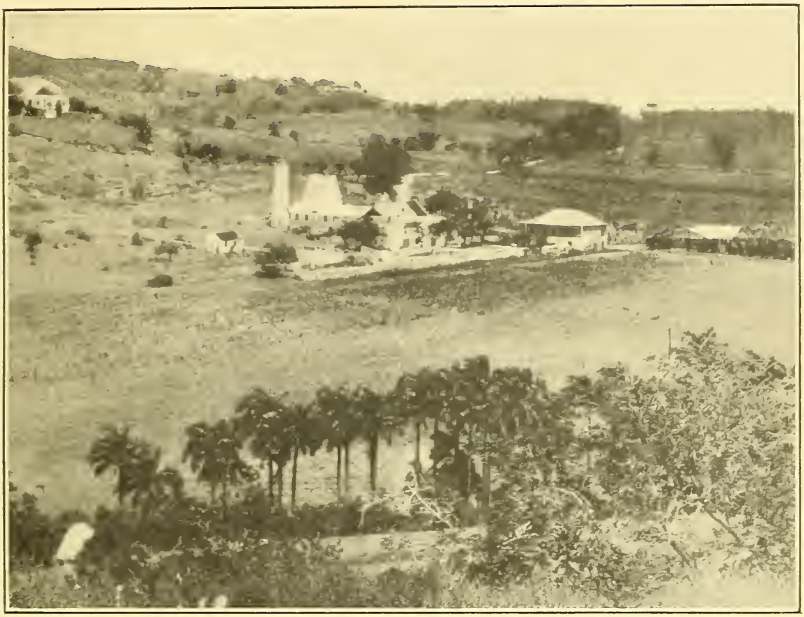

FIG. 1.—VIEW OF EXPERIMENT STATION BUILDINGS AND GROUNDS.

FIG. 2.—SUGAR MILL AND CANE FIELDS, ST. CROIX.

FIG. 1.—S. C. 12/4 SUGAR CANE.

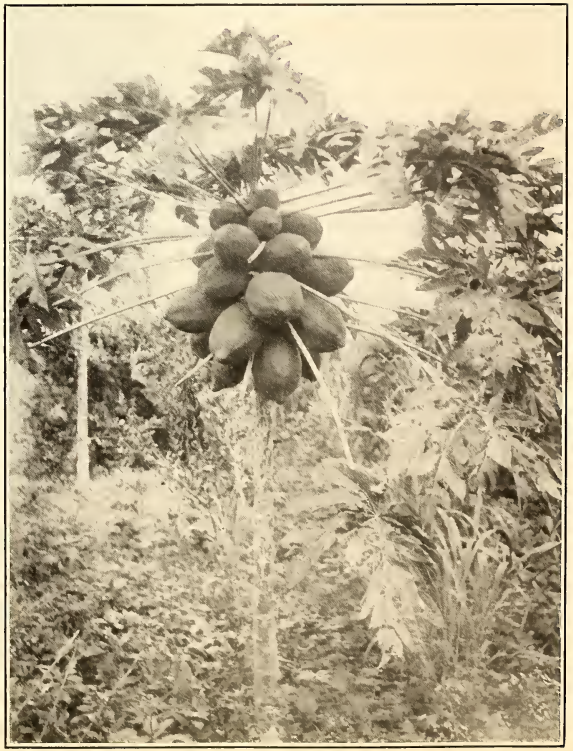

FIG. 2.—PAPAYA ON STATION GROUNDS.

average from 5 to 7 inches in length. An exceptionally good specimen in a ratoon field had the following measurements: Weight of cane, 21 pounds; length, 12 feet; number of joints, 33; circumference, 6.25 inches. Many of the canes in the field approximated to these measurements.

The cane is cylindrical or slightly constricted between the nodes. The dormant roots at the nodes have a tendency to sprout after having been injured by borers. The cane is yellowish green in color and is covered with a bloom of white wax. Above each node there is a prominent ridge which encircles the cane and marks the limit of the band of dormant roots. The longitudinal channel leading from the bud is well marked in the upper nodes, but is rather obscure in the lower ones. The eyes are broad, pointed, and fairly prominent. Germination from tops and pieces of cane is always good. The leaves are broad and very dark green, features which, together with the upright habit of the cane, make it easy to distinguish the variety even from a distance. The leaf breadth is usually 3 to 3.5 inches. The leaf sheaths average 1 foot in length and the leaf blades 4.5 to 5 feet. The width of the leaf sheath averages 6 to 6.5 inches. These dimensions apply to the cane as grown without irrigation in St. Croix.

Other promising varieties.—Some other varieties of cane which give promise of producing more sugar per acre than the standard cane of the island are: S. C. 12/3, S. C. 12/7, S. C. 12/37, S. C. 13/13, S. C. 12/11, S. C. 14/7, S. C. 14/93, D. 109, B. 4596, B. 3412, and B. 3390.

Owing to lack of competent help during the cane-cutting season, but few of the cane plats were weighed and analyzed.

FERTILIZER EXPERIMENTS.

No experiments with artificial fertilizers were carried out during the past year, the work of previous years having fully demonstrated the futility of applying these fertilizers in a country where the limiting factor in cane production is the rainfall. Work with artificial fertilizers, conducted during the first years after the establishment of the station, showed the soil of St. Croix to contain in general all the plant food required by the comparatively small crop which the normal rainfall produces.

It is quite otherwise with farmyard manure, which produces obvious increases in the crop. This increase is probably due mainly to the improvement in the mechanical condition of the soil brought about by the farmyard manure, which affects the water retaining capacity of the soil. The station has developed a method of applying the manure which seems to be superior to that usually employed in the island. After fallow plowing and harrowing, the land is scored out into furrows with a Cuban No. 22 plow, two cuts with the plow being used to make each furrow. Farmyard manure, at the rate of

25 to 30 tons per acre, is then placed in the furrows and covered with a small vineyard plow. This procedure leaves the land almost flat. The cane cuttings are then planted through the manure. This method is recommended for use only during the more rainy months of October, November, December, and May.

In St. Croix, the usual method of applying farmyard manure is to place it in furrows, as above explained. A deep furrow is then scored out between the rows of manure. The furrow is generally made with two cuts of a large plow, which is followed by laborers who haul the loose mold out of the furrow and pile it on the banks. This operation, which is known as "combing the banks," certainly leaves the field in a very fine condition. Its practical value is, however, very doubtful. A number of planters now realize that the double moldboard plow does nearly as satisfactory work as the large gang. The canes are planted in the subsoil at the bottom of the furrow. Experiments carried on have proved the station method to secure the best germination and the more abundant tillering. It is thought that planting the cane in the subsoil will enable it to better resist drought, and to ratoon in a more excellent manner. In regard to drought resistance, it has not been noticed that the deep-hole method of planting has resulted in any gain. However, the relative ratooning power of the two methods has not yet been thoroughly tested.

The new method of planting is a great advantage over the old in that it not only requires less labor to prepare the land for canes, but it enables the operator to use machines for cultivation since the land is left almost flat. The usual method of preparation, that of leaving the cane plants at the bottom of a deep furrow, necessitates a great deal of hand weeding.

EXPERIMENTS IN PLANTING CANE AT DIFFERENT DISTANCES.

Experiments at the station show that cane should be planted rather closer than is the custom in the island. The usual distance is 5 by 3 feet. Carefully planned and weighed experiments, described in former reports,[1] show that 4 or 4½ feet by 2 feet give the best results.

PREVENTION OF DISEASE.

The employment of sound cuttings, free from borers and *Marasmius sacchari*, will do more than anything else to eliminate disease from canes. Probably more than three-fourths of the cuttings planted in the island are unsound. It is a waste of time to take such great pains to prepare the ground thoroughly, as the St. Croix planters do, and then ruin their work by planting diseased cuttings. In St. Croix, nevertheless, it is a rule to use for planting canes from a field of ratoons which are so diseased that they are little more than a mass of trash. So long as this practice continues, the yields must necessarily be small.

[1] Rpts. Agr. Sta. St. Croix, 1914, p. 16; 1915, p. 10.

SOIL GRUBS.

The method of controlling soil grubs, particularly *Stratægus titanus*, by means of poisoned bagasse, devised and advocated by the writer some years ago,[1] gave good results at Betty's Hope plantation upon which it was well tried.

The method consits in inserting handfuls of bagasse mixed with Paris green at frequent intervals in the soil, say, every 5 feet apart. This mixture may be planted on top of the manure when the land is in course of preparation and just before it is covered with the plow. At any time after the cane has been planted, handfuls of the mixture may also be inserted in holes made by a crowbar.

COTTON EXPERIMENTS.

In September, 1918, 15 acres was planted to 54 selections and varieties of Sea Island cotton. Owing to the continuous rainy weather, which almost immediately succeeded the planting, and also to the lack of funds needed for weeding, the field became overrun with noxious plants, and cotton worms appeared in immense numbers. As soon as it became apparent that the plats were practically lost, five plants were removed from each plat and transplanted in order that the varieties should not suffer destruction. From these small trials a further selection was made, the seed of which will be planted in September, 1919.

An apparently new variety of cotton, secured as the result of selection from a field of Sea Island cotton at the station, was tried out this season on a two-acre plat at the Hogensborg plantation. The seed sown was that of a single plant, only one seed being placed in each hole. A poor stand was, in consequence, obtained and no fair yield trial could be made. The plants, however, grew remarkably well, being obviously superior to the ordinary Sea Island cotton grown in the same field. Some seed of this variety of cotton was sent this year to the United States Department of Agriculture for trial in Arizona. Previous trials of this variety carried out on a large scale at Betty's Hope plantation had given splendid results.

The chief aim of the cotton experiments is to secure a variety which will combine a heavy bearing character with extra long and fine lint. The experiments which have been going on for eight years show a marked improvement in these respects in the cotton now grown in the island. Nearly all the cotton planted in the island is pedigree cotton obtained from the experiment station. Splendid yields were reported this year from all the plantations growing this pedigree cotton. One plantation reports having picked over 60,000 pounds of seed cotton from 50 acres.

Another aim of the experiments is to produce a variety resistant or immune to blister mite. Progress has already been made in this direction.

[1] Rpts. Agr. Expt. Sta. St. Croix, 1913, p. 40; 1914, p. 26; 1915, p. 24.

CORN EXPERIMENTS.

The work of corn selection has been carried on at the station for about five years. The ear-to-row method of selection is the one employed. The best ears of the heaviest bearing rows are selected for planting to large plats, the seed of this being distributed to planters. (Pl. III, fig. 1.) By this means the yield of corn has been doubled. Until the present year the amount of seed corn raised at the station was sufficient to supply the requirements of the islands. Now, however, that the revenue derived from the sale of products no longer accrues to the station this policy has been discontinued.

Hardly any improved corn was grown in the island before the station commenced to distribute it, as the cultivation did not pay. Now, a large amount is grown and a fine corn mill has been erected by a sugar company. Most of the corn grown is planted on the banks between cane rows, a method which appears to be quite practicable as well as profitable, since the cane shows little or no setback and the corn yields 800 to 1,000 pounds of shelled grain per acre. When planted in this way two seeds are placed in each hole and the holes are spaced from 5 to 6 feet apart. This is the method advocated by the station. Closer planting interferes with the growth of cane.

Careful observations were made to determine whether the practice of growing corn on the cane banks would result in an increase of cane-borer attack; no ill effects were noticed, however, where the cornstalks were removed to the press immediately after the ears were harvested.

In addition to continuing the work of selecting corn from varieties already acclimatized to the West Indies, the station worked on several new varieties received from the United States Department of Agriculture at Washington. None of these varieties, however, gave yields even approaching those from the acclimatized sorts. Hickory King gave the best results of all the new kinds. Some hybrids of this variety with the acclimatized sorts were made and will be tried next planting season.

Some Hopi maize was obtained from Washington for hybridizing purposes. Unfortunately, though planted on two different occasions, the variety succumbed to the attacks of the insect *Dicranotropis maidis*. It is believed that a cross between Hopi maize and acclimatized West Indian corn would be particularly valuable for this climate. It frequently happens that a delay of 24 hours between two plantings after a rain results in the greatest difference in the crop, the tropical sun rapidly drying out the soil. If acclimatized West Indian corn, like Hopi maize, could be planted several inches deep in the ground, this would not occur.

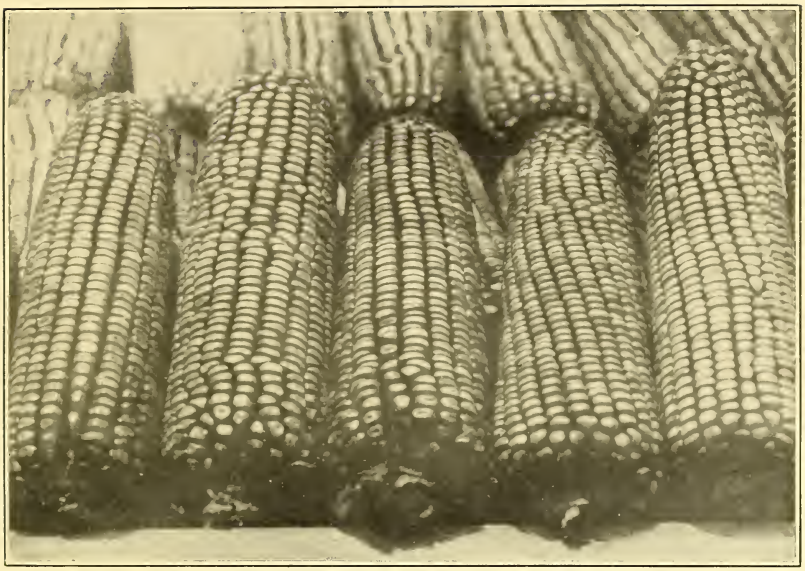

FIG. 1.—SELECTED EARS OF ACCLIMATIZED CORN.

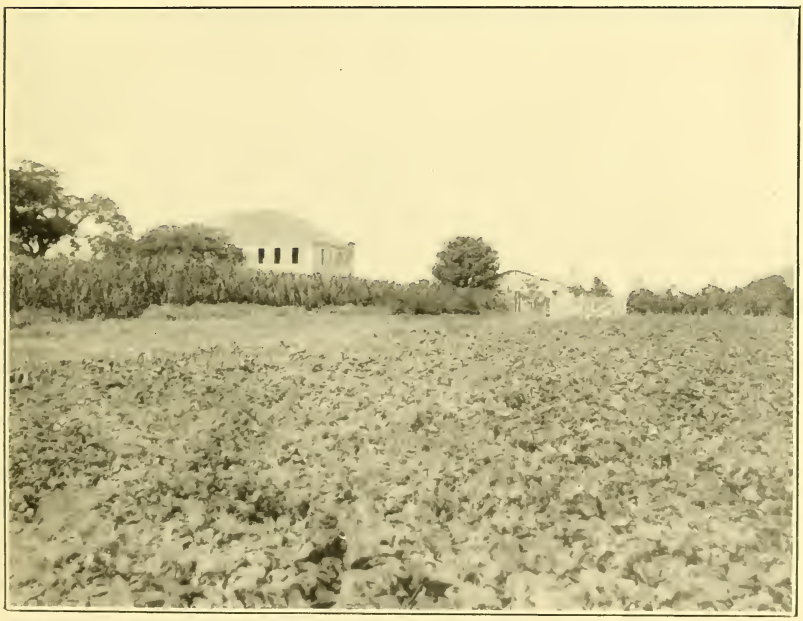

FIG. 2.—BLACK ROCK SWEET POTATOES. ELEPHANT GRASS AND STATION LABORATORY IN BACKGROUND.

FIG. 1.—VELVET BEANS GROWN AS GREEN MANURING CROP.

FIG. 2.—EXPERIMENT IN ESTABLISHING COCONUT GROVE.

PESTS OF CORN.

Dicranotropis maidis is the worst pest of corn with which the Virgin Islands has to contend. Since this pest has quite a number of host plants other than corn, it is difficult to suggest a means of control. The acclimatized corn resists its attacks better than newly introduced varieties. All kinds of corn, if planted during the dry months, are liable to be killed by it.

Corn-ear worms frequently severely attack young corn, eating the heart of the plants. In favorable weather the plants outgrow the attack. A pinch of cornmeal containing 5 per cent lead arsenate placed in the heart of each plant will kill the worms.

LEGUMINOUS CROPS.

Trials were made during the year with a large number of legumes, both for green-manuring purposes and for grain.

Madagascar bean (*Phaseolus lunatus*) produced the best covering and was not attacked by caterpillars at any season of the year. Unfortunately, these vines bear no seed, owing apparently to a fungus which attacks the flower stalks and small pods. The same fungus attacks many other varieties of beans and renders them quite sterile.

Lyon beans and velvet beans made excellent growth, and since they are not attacked by the above-mentioned fungus they can be highly recommended for green-manuring purposes. The closely related Pachylobium bean is also good. Lyon, velvet, and Pachylobium beans are best planted in the month of April. When planted later than June they are almost certain to be eaten down by caterpillars in September. If planted earlier, they can be plowed under before the caterpillar season sets in. (Pl. IV, fig. 1.)

Canavalia beans, which are little attacked by worms and fungi, also gave good results as green manure. For early planting, the station recommends Lyon and velvet beans, and for late planting *Canavalia ensiformis.*

The trials of legumes for grain included soy beans, tepary, pinto, mungo, *Botor tetragonoloba*, black Venezuelan beans, White Navy, Mohawk, Long Yellow Six Weeks, Lima, Black Wax, and some others. The seed of most of these was obtained from the experiment station at Mayaguez, Porto Rico. The best results were obtained from black Venezuelan. Mungo, White Navy, and Long Yellow Six Weeks gave moderate results, while the rest were poor. St. Croix soils in general do not appear to be well suited to the growing of legumes. All the planters who tried the method of planting beans on the cane banks, so successfully adopted in Porto Rico, reported poor results.

ALFALFA.

A number of varieties of alfalfa were obtained from various experiment stations and from the United States Department of Agriculture. After being planted, however, these varieties were lost,

since it was impossible to cope with the weeds which came up very thickly in most of the plats. A plat of nonirrigated alfalfa, grown from seed secured from Salt Lake City, was saved from the weeds and made fairly good growth. A number of selections were made from this variety and their seed later planted in a small plat. The original plants are being allowed to grow in a plat containing bay grass and other weeds, the hope being that natural selection will aid the station to produce a variety better able to compete with the environment in St. Croix. Seed of selected individuals which survive will be kept for further work. It is the intention of the station to introduce again quite a number of varieties from the States and from elsewhere, and it is hoped that the next trial will be more successful.

Work with alfalfa is a promising line and, if successful, will be of immense benefit to the West Indies.

GRASSES.

Guinea grass (*Panicum maximum*) grows freely on the hills of all the Virgin Islands. It is a splendid grass, responding quickly to rain, growing fast, and being much relished by all kinds of stock. It is the principal grass of the islands. Selection work on this grass will be taken up by the station as soon as possible.

Barbados sour grass (*Andropogon pertusus*) is grown to a small extent on a few plantations. It is not eaten by stock until dry weather, when the guinea grass has been grazed off. Sour grass makes a valuable reserve fodder for the stock and is the richest fodder of all the grasses of the Virgin Islands. Its use should be increased.

Para grass (*Panicum barbinode*) grows freely, especially on swamp land, but because it is a noxious pest on cultivated land it is not a grass to be encouraged.

Sudan grass (*Andropogon sorghum sudanensis*). Some years ago the experiment station introduced Sudan grass in these islands. This grass can not be recommended for more extensive plantings, as it has been found to acquire rust abundantly and to harbor the sorghum midge.

Napier or elephant grass (*Pennisetum purpureum*). In October, 1918, six cuttings of this grass were received from Porto Rico and these have made excellent growth. As a result of this small beginning the station now has growing about one-fifth of an acre of grass which so far promises to be the best introduction of this kind. Cuttings will soon be available for distribution.

COCONUTS.

In December, 1916, fields Nos. 5B and 5C and part of field No 16 at the experiment station were planted to coconuts. The fields were plowed and prepared as if for sugar cane; that is, in a series of banks and furrows, the furrows being made 5 feet apart. Every

sixth furrow was planted with coconuts, the nuts being spaced 25 feet apart, and cane was planted in the rest of the field. The nuts made very moderate growth, and a fair crop of plant canes and of ratoons was harvested. This method of establishing a coconut grove was employed as an object lesson to show how a plantation could be changed over from cane to coconuts without in the least disorganizing the work of the estate or causing a long period during which returns would cease. (Pl. IV, fig. 2.) By the use of this method of planting the change from cane to coconuts is made quite gradually, the yield of cane falling off as the coconut trees increase in size. By the time the canes have ceased to yield a crop the coconuts are nearing their bearing stage.

Coconuts could be grown successfully on any of the estates now planted to cane. If the price of sugar decreases to any extent, or if the laborers continue to emigrate at the rate they are now doing, some such change is bound to take place.

EXPERIMENTS WITH CITRUS PLANTS.

About four years ago a small grove of lime trees was established in Field 3 at the experiment station. The trees made poor growth at first on account of dry weather, but the good rains of the past two years have improved them very much and some are now beginning to bear. During dry weather the trees are badly attacked by scale insects. Some suffer from die-back.

About five years ago some budded orange and grapefruit trees were imported by this station from Florida. The majority of these trees died, but the few which survived, though severely suffering from die-back, are making moderate growth. The few fruits which were produced, for the first time last year, were stolen from the station.

In 1912 some spineless lime seeds were imported from Dominica. The plants came for the most part true to seed and produced fair-sized trees which are bearing well. The fruits have several advantages over the ordinary limes in that they are almost seedless, of better flavor, and more pungent to the taste. The limes average less than one seed per lime. Because of this almost seedless character these limes might find a special market for candying purposes.

EXPERIMENTS WITH PAPAYA.

A regular planting of papayas has been kept up at the experiment station from seed imported in 1912 from Hawaii (Pl. II, fig. 1). While papaya seed was freely distributed and the fruit apparently appreciated, few trees are found growing in the island. Seed was also sent to St. Thomas. The papaya makes a splendid vegetable when cooked green, and in flavor resembles squash. It is difficult to understand why this plant is not more universally grown in the plantations, since a half dozen trees would suffice to supply an abundance of fruit and healthful vegetable throughout the year.

SWEET POTATOES.

The only variety grown at the station during the past year was the Black Rock, introduced from Barbados by the station some years ago (Pl. III, fig. 2). This variety, which is preferred by the people to all others, is now grown in St. Croix more extensively than any other sort. Cartloads of vines for cuttings are given away by the station every year to those who make application for them. The introduction of this variety of potato has been a great boon to the laborers of the island.

STATION IMPROVEMENTS.

In October, 1916, the hurricane which swept over the island damaged buildings at the station to the extent of $5,000. Part of the damage was repaired in 1917, but most of the reconstruction has been done during the past year. The old boiling house, which was almost completely destroyed, was rebuilt and is now being used as a storehouse and shelter. The roof of the laboratory building, which was also severely damaged by the gale, has been repaired. The dwelling house in the lower yard was extensively repaired for the use of the entomologist.

A new shed for carts and automobiles is in course of erection. A large cistern for rain water was built in the village for the use of the laborers, and galvanized gutters were placed on one of the village buildings to catch the water for this cistern.

A small motor plow and a motor cultivating machine were purchased for the station, a gas machine was introduced for the use of the chemical laboratory, and an electric-light plant will shortly be installed.

RAINFALL AT THE EXPERIMENT STATION.

The rainfall for the year 1918 was as follows:

	Inches.		Inches.
January	1.06	August	1.15
February	2.01	September	3.58
March	1.29	October	8.21
April	1.09	November	10.33
May	5.50	December	1.86
June	4.04		
July	3.57	Total	43.69

The rainfall for the six months ending June 30, 1919, was as follows:

	Inches.		Inches.
January	2.74	May	2.17
February	1.76	June	2.95
March	1.64		
April	9.19	Total	30.45

The rainfall for April, 1919, was the highest ever recorded for that month, the average rainfall for over 60 years having been only 2.60 inches.

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Crop Estimates.